

Post-dispersal seed fates in a Western Oregon native prairie

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Abstract

Knowledge of post-dispersal seed fates and other regeneration characteristics is crucial for predicting abundances and distributions of populations and ultimately, community species composition and diversity. Though crucial, seed fate studies are rare primarily due to the difficulty of determining seed fates and causes of mortality.

This thesis investigated post-dispersal seed fates for four species common to western Oregon native prairies: *Bromus carinatus* Hook and Arn. var. *carinatus*, *Cynosurus echinatus* L., *Daucus carota* L, and *Prunella vulgaris* var. *lanceolata* (Barton) Fern. The general approach was to sow seeds of these species into experimentally manipulated field plots for each of two years, and to recover these seeds from the soil one year later to determine their fates. The effect of mowing on seedling establishment was also addressed. Additional studies focused on the effects of a single mortality factor, fungal disease, on seeds and seedlings.

The fate of most seeds was death (44%-80%). Mowing did not significantly increase seedling establishment. Only *Daucus carota* formed a persistent seed bank.

Fungal disease generally caused less than ten percent mortality. The additional studies investigating fungal disease corroborated these results. Vertebrate predation significantly reduced seed numbers for only *Bromus carinatus* (21%). The largest cause of death for all species for both years was the combined group of other mortality causes (invertebrate predation, interference, and abiotic factors) (52%-73%). The components of this combined group, however, differed among species. The most likely components for *Bromus carinatus* and *Cynosurus echinatus* were interference (competition plus allelopathy) and abiotic factors, although invertebrate predation cannot be ruled out for *Bromus carinatus*. Seedling death due to abiotic factors was most likely the largest component for *Daucus carota*. The most probable components for *Prunella vulgaris* were invertebrate predation and abiotic factors.

Implications of these seed fates and mortality factors for population patterns and for conservation of native prairies are discussed.